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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/789,572	02/27/2004	Bing Zheng	10541-1929	9288

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EXAMINER

LUBY, MATTHEW D

ART UNIT	PAPER NUMBER
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3611

DATE MAILED: 05/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/789,572

Applicant(s)

ZHENG ET AL

Examiner

Matt Luby

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9, 12-22, 25 and 26 is/are rejected.
- 7) ☒ Claim(s) 10, 11, 23 and 24 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/27/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed 02/27/04 fails to comply with 37 CFR 1.98(a)(3) because it does not include a concise explanation of the relevance, as it is presently understood by the individual designated in 37 CFR 1.56(c) most knowledgeable about the content of the information, of each patent listed that is not in the English language. It has been placed in the application file, but the information referred to therein has not been considered with respect to the Foreign Japanese Patent Documents JP11029020; JP11099921 and JP22099923. Furthermore, reference 2002/0108895 is a non-document and is believed to be the wrong number of a U.S. Pre-Grant Publication and therefore has also not been considered.
2. The information disclosure statement filed 02/27/04 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered with respect to the Publication: Adaptive Steering, Bendix Technical Journal, Autumn 1969 since there has been no copy of this reference received.

### ***Specification***

2. The disclosure is objected to because of the following informalities: Equation 2 refers to a component  $V_h Spt$  but this is not defined in the specification. Furthermore,  $V_h Spd$  has been used to define both the vehicle speed in Equation 1 (page 5) and the steering wheel angle in Equation 2 (page 6).

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 8, 9, 21 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

5. Claims 8, 9, 21 and 22 recite "Steeringratio" as one of the components in the equation for calculating  $r_{des}$ . This component is not defined in the list of defined equation components of claims 8, 9, 21 and 22. Furthermore, it is going to be assumed that the acceleration due to gravity has some type of relationship to Applicant's defined component,  $K$  (the understeer coefficient), since the acceleration due to gravity would be a necessary component in calculating a desired yaw rate. The Examiner would like to inquire to the Applicant if they contend that the equations of claims 8 and 9 are patentably distinct? It is the Examiner's assertion that calculating yaw rate and lateral acceleration are inherent principles in vehicle stability systems for controlling oversteer

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and understeer, and that further, the equations in claims 8, 9, 21 and 22 are well known equations for calculating yaw rate and lateral acceleration. In other words, are the equations the inventive concept?

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 13, 14 and 26 are rejected under 35 U.S.C. 102(e) as being anticipated by Magnus (U.S. Pat. No. 6,547,031).

Magnus discloses a system and method (10) for compensating understeer and oversteer in a vehicle having a steer by wire system (this is a functional limitation and therefore goes to the intended use of the system, 10, and a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art MPEP Chapter 700), the system comprising:

a driver interface system (20) for receiving steering input;

a sensor system (38) to sense the steering input and generate a steering control signal (36);

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a controller (30) in electrical communication with the sensor system to receive the steering control signal, wherein the controller is configured to determine when an understeer or oversteer condition exists and generate a steering assist signal (col. 1, lines 14-17; 25-29; col. 2, lines 20-58; and

a road wheel steering actuation system configured to receive the steering assist signal and adjust a road wheel angle based on the steering assist signal (col. 2, lines 27-31, i.e., the power assist actuator);

wherein the controller is configured to determine if an understeer condition exists based on a measured yaw rate and a measured lateral acceleration signal (col., 1, lines 7-11 discuss that oversteer or understeer, i.e., instabilities, are generally a function of a combination of the yaw rate and lateral acceleration of the motor vehicle; col. 2, lines - discuss that upon processing of measured yaw rate from yaw rate signal 40 and lateral acceleration from a lateral accelerometer not shown, an output signal 32 is derived which ultimately effectuates the manipulation of the power steering system by autonomously changing the angle of the steerable wheels and thereby maintaining stability of the vehicle and preventing oversteer or understeer); and

wherein the controller is configured to generate a steering assist signal such that a yaw rate error and a lateral acceleration error is minimized (col. 4, lines 52-57).

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magnus in view of Thomas et al. (U.S. Pat. No. 6,659,218).

Assuming *arguendo*, that the functional limitation in claim 1 of a steer-by-wire is by some chance found to be patentably distinguishing and that Magnus does not teach this, Thomas et al. disclose that it is well known to use a steer-by-wire system with a understeer/oversteer compensation system (col. 1, lines 39-43) in order to easily implement such a system to improve the drivability and safety of the vehicle since there is no mechanical linkage between the hand wheel and the road wheels (col. 1, lines 39-43). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide that the steering system of Magnus is a steer by wire system, as taught by Thomas et al., in order to easily implement a understeer/oversteer compensation system to improve the drivability and safety of the vehicle.

9. Claims 2-9 and 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magnus in view of Karnopp et al. (U.S. Patent No. 4,941,097), or in the alternative over the modified Magnus in view of Thomas et al. device, as applied to claim 1 above, and further in view of Karnopp et al.

Magnus does not specifically disclose the controller determines an understeer condition exists when the magnitude of the desired yaw rate is greater than the measured yaw rate by a first threshold value for a time period and the magnitude of the desired lateral acceleration is greater than the measured lateral acceleration by a

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second threshold for the time period, that an oversteer condition exists when the magnitude of the desired yaw rate is less than the measured yaw rate by a first threshold value for a time period and the magnitude of the desired lateral acceleration is less than the measured lateral acceleration by a second threshold for a time period or that the desired yaw rate is calculated according to the relationship of claims 8, 9, 21 or 22. Karnopp et al. disclose that understeer exists when the desired yaw rate and lateral acceleration are greater than the measured values of such for a time period (in the discussed embodiment of Figures 4 and 5, lateral acceleration is measured, converted to a yaw rate and compared with desired values in the same way discussed with the embodiment of Figure 3, i.e., as stated in column 3, lines 17-19, when the desired values are greater than the measured values, an understeer condition exists), that an oversteer condition exists when the desired yaw rate and lateral acceleration are less than the measured values for such parameters for a time period (col. 3, lines 20-21) or that the desired yaw rate and lateral acceleration are calculated according to the equations of claims 8, 9, 21 and 22 (col. 3, lines 1-14; wherein lateral acceleration is just wheel angle squared) in order to provide a steering system which minimizes oversteer and understeer conditions in a simplified manner requiring a minimum number of parts (col. 4, lines 35-40). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide that the controller determines an understeer condition exists when the magnitude of the desired yaw rate is greater than the measured yaw rate by a first threshold value for a time period and the magnitude of the desired lateral acceleration is greater than the measured lateral acceleration by a second threshold for



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the time period, that an oversteer condition exists when the magnitude of the desired yaw rate is less than the measured yaw rate by a first threshold value for a time period and the magnitude of the desired lateral acceleration is less than the measured lateral acceleration by a second threshold for a time period or that the desired yaw rate is calculated according to the relationship of claims 8, 9, 21 and 22 on the Magnus or modified Magnus device, as taught by Karnopp et al., in order to provide a steering system which minimizes oversteer and understeer conditions in a simplified manner requiring a minimum number of parts.

10. Claims 12 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magnus in view of Deng et al. (U.S. Patent No. 6,292,094), or in the alternative over the modified Magnus in view of Thomas et al. device, as applied to claim 1 above, and further in view of Deng et al.

Magnus does not specifically disclose that the controller is configured to generate a steering assist signal based on a proportional integral algorithm. (The Examiner would like to inquire whether it is Applicant's position that using P-I, proportional-integral control, is in their opinion, patentably distinct over prior art controllers that are used to generate steering assist signals? It is the Examiners opinion that proportional-integral control is notoriously well known in the art of calculating control signals for various vehicle systems, including a steering assist signal. Furthermore, the Applicants are invited to state on the record the a PI control algorithm is a patentably distinguishing feature of a steering assist signal calculation.) Deng et al. disclose that a steering assist signal is generated based on a proportional integral algorithm (col., 10, lines 48-63) in

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order to aid in successfully completing a turning operation (col. 3, lines 33-45). It would have been obvious to one of ordinary skill in the art at the time of the invention to provide that the controller is configured to generate a steering assist signal based on a proportional integral algorithm on the Magnus or modified Magnus device, as taught by Deng et al., in order to aid in successfully completing a turning operation.

### ***Allowable Subject Matter***

11. Claims 10, 11, 23 and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure because it relates to systems for compensating for understeer and/or oversteer through detection of measured yaw rates and/or lateral acceleration.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matt Luby whose telephone number is (571) 272-6648. The examiner can normally be reached on Monday-Friday, 9:30 a.m. to 6:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lesley Morris can be reached on (571) 272-6612. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Matt Luby  
Examiner  
Art Unit 3611

M.I.  
May 3, 2005